Form Approved
OMB No. 0704-0188

(2)

AD-A233 246

ite.	3. Report Type and Dates Covered.
1989	Abstract

4. Title and Subtitle.

Mutual Augmentation of Region and Edge Detection Techniques in Segmentation and Analysis of Oceanographic IR Images

5. Funding Numbers.

Program Element No. 62435N
Project No 35870
Task No
Accession No. DN256010

6. Author(s).

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7. Performing Organization Name(s) and Address(es).

Naval Oceanographic and Atmospheric Research Laboratory*
Stennis Space Center, MS 39529-5004

8. Performing Organization Report Number.

AB 89:321:086

9. Sponsoring/Monitoring Agency Name(s) and Address(es).

Naval Oceanographic and Atmospheric Research Laboratory*
Ocean Sciences Directorate
Stennis Space Center, MS 39529-5004

10. Sponsoring/Monitoring Agency Report Number.

AB 89:321:086

11. Supplementary Notes.

*Formerly Naval Ocean Research and Development Activity
**Continued on next page
The 18th AIPR Workshop

12a. Distribution/Availability Statement.

Approved for public release; distribution is unlimited.

12b. Distribution Code.

13. Abstract (*Maximum 200 words*).

A crucial first step in the computer aided recognition of features in a digital image is the segmentation of the image into subsets which roughly represent objects or phenomena in the depicted scene. The process of segmentation has traditionally been executed in one of two fundamentally different ways: edge based segmentation and region based segmentation. In edge based segmentation the image is scanned for intensity gradients which represent borders between image features, while in region based segmentation features are detected by intensity uniformity between contiguous pixels. The locally oriented edge and the globally oriented region detection techniques provide information that reflects different but important aspects of the image.
This paper described a knowledge based system for the understanding of oceanographic IR imagery which uses both region and edge detection techniques in a mutually augmentory way. The automated interpretation system uses a cluster shade edge detector capable of distinguishing edges from noise and an iterative split/merge region detector to perform image segmentation. Region and edge information is combined**

14. Subject Terms.

(U) Remote Sensing; (U) Artificial Intelligence; (U) Microbubbles; (U) Langrangian Drifter

15. Number of Pages.

1

16. Price Code.

17. Security Classification of Report.	18. Security Classification of This Page.	19. Security Classification of Abstract.	20. Limitation of Abstract.
Unclassified	Unclassified	Unclassified	SAR

NSN 7540-01-280-5500

Standard Form 298 (Rev 2-89)
Prescribed by ANSI Std Z39-18
298-102

**combined in a spatial correlation technique which applies contextual and temporal constraints for edges and regions as well as predefined edge/region correlation rules to group edges and regions into clusters which match image features. The results of edge/region correlation are used to iteratively redirect the edge detection and region detection processes. It is shown that, for the oceanographic images studies, the mutual augmentation of edge and region detection yields more concise feature identification and higher confidence in edge and region labelling.